the anti-microbic sera seem to neutralise through the interaction of two substances, one present in the serum, the other a constituent of the patient's body and limited in amount, so that when the whole of the latter has taken part in the neutralisation, no additional amount of the therapeutic serum produces a further neutralisation.

Again, an anti-streptococcic serum prepared with streptococcus A, though active against A, does not necessarily neutralise another streptococcus B. In diphtheria also, a local and visible lesion generally enables a diagnosis to be made, and serum treatment to be applied, before any great amount of tissue damage has been done, whereas in tetanus, for which a very potent antitoxin has also been prepared, it is the results of tissue damage which lead to a diagnosis. No therapeutic serum can, of course, *repair* tissue damage, and if this has proceeded beyond a certain degree the condition becomes incompatible with life. It is noteworthy that even in diphtheria, if treatment be delayed beyond the third day, antitoxic treatment produces results little better than treatment without antitoxin, tissue damage having proceeded to too great an extent during the interval.

The fearful prevalence of plague in India during the last few years, which has caused the death of hundreds of thousands of the inhabitants of that great Empire, has naturally directed attention to the serum therapy of this disease, since no ordinary form of treatment has any particularly beneficial effect, and the Government of India has therefore been well advised to devote one of its scientific memoirs[1] to the subject, under the editorship of Lieut.-Col. Bannerman, M.D., I.M.S., who has had much experience of plague. Various forms of anti-plague serum were the subjects of trial, the Roux-Yersin, Lustig, Haffkine, Terni, and Brazil, the details of the preparation of which are given, and tables of the results obtained. Col. Bannerman concludes from a study of the circumstances and of the case-mortality of the various series of cases treated with the different sera that (1) the Roux-Yersin serum did not affect the case-mortality in the slightest degree, (2) in three out of the four trials made with Lustig's serum the case-mortality of the serum cases was higher than among those receiving ordinary treatment, (3) with Haffkine's serum there is no certain evidence of its efficiency, (4) with Terni's serum there is a difference of 0.91 per cent. only in favour of the serum-treated cases, and (5) with Brazil's serum, though there is a difference of 2.85 per cent. in favour of the serum-treated cases, it is problematical if this can definitely be ascribed to the serum.

As regards case-mortality, therefore, these trials do not suggest that serum therapy in plague is of much, if of any, value, but clinically there is an amelioration in the symptoms, and the cases when treated with serum live for a longer period than without it. We might add that the series of cases treated with Terni's and with Brazil's serum (110 and 70 respectively) are too small to warrant any definite conclusions. Bannerman from these results considers that it will be necessary to commence anew the study of the serum therapy of plague, and with this we cordially agree. At the same time we cannot help thinking that it would be desirable to make a much more extended use than has been done of the intravenous method of administration of the serum.

R. T. Hewlett.

SEA COAST PROTECTION.

A CONFERENCE of local authorities having districts situated on the seaboard of England was held in London on February 6 on the subject of the defence of the coasts against erosion by the sea, and the national responsibility in regard to the matter. This conference was convened by the chairman of the Herne Bay District Council. The matter had been taken up by the sea-side towns on the east coast in 1903, and a deputation was then appointed to wait on Mr. Balfour, but nothing came of this. The conference recently held consisted chiefly of representatives of towns on the south coast, and a resolution was adopted "That representatives of this conference be appointed to approach the Prime Minister and President of the Board of Trade, to request the Government to introduce into Parliament a Bill declaratory of the aforementioned principles and defining ways and means whereby some relief towards, or allowance in respect of, the cost and maintenance of protective works might be contributed by the Government." The report of the meeting that appeared in the public journals does not say what "the aforementioned principles" consist of.

The members who attended this conference consisted almost entirely of representatives of sea-side towns, where promenades and similar works have been constructed for the purpose of enhancing the attractions of these places.

The *Engineer*, in an article on this conference, points out that to protect efficiently long stretches of purely agricultural land, the sea margin of which consists of friable and easily eroded material exposed to the inroads of the sea, would (as shown in the book on "The Sea Coast," published by Messrs. Longmans and Co.) involve a capital and maintenance expenditure out of proportion to the advantages secured, the value of the land preserved during the life of the protective works not being equal to one-third of the outlay required for protecting it.

In the case of sea-side resorts or other localities where the coast-line is of considerable value, the *Engineer* points out that while the preservation of the littoral is an absolute necessity, the benefits to be derived by protection are almost wholly local, and the owners of agricultural land not worth the cost of protection would have a perfectly legitimate grievance if Imperial funds were spent for the benefit of their wealthier neighbours. It may also be added that all inland towns would have an equal right to protest against contributing towards money spent on these sea-side towns, where promenades and other works have been constructed to attract visitors, and thereby have enormously increased the value of the property of those whose land is adjacent.

There was one part of the subject of coast erosion alluded to at the meeting which might with more reason be pressed on the attention of the Government, that is, the prevention of the removal of sand and shingle from the beach, which now forms a natural protection to the shore. As the law now stands, the Board of Trade, on being applied to, will order a local inquiry where complaint is made of injury done by such removal, and if as the result of such inquiry it is shown that such removal is injurious, the Board can, under its statutory powers, issue an order forbidding any further removal. The cost of these inquiries, however, is considerable.

In some cases the Government itself is the offender, shingle being taken for making concrete for its coast works. In many cases the local authorities, who are now asking for State relief, have been the worst offenders in this respect, by placing their sea walls so

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[1] *Scientific Memoirs of the Government of India*, No. 20, 1905. Serum Therapy of Plague in India. Reports by Mr. W. M. Haffkine, C.I.E., and various Officers of the Plague Research Laboratory, Bombay. Edited with an Introduction by Lieut.-Col. Bannerman, M.D., B.Sc., I.M.S., Director, Plague Research Laboratory, Bombay.

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as to shut in the natural shingle banks behind the walls or using the material from them for their works.

The Government might justly be asked to obtain such an alteration in the existing law as would make any removal unlawful unless it could be shown that such removal would not in any way be injurious to adjacent property, and making it the duty of the coastguards to report where any removal of shingle or sand is taking place.

NOTES.

The present year will witness the fiftieth anniversary of the foundation of a great branch of chemical industry which, perhaps more than any other discovery in applied chemistry, has reacted upon the science itself to its lasting benefit. Half a century ago the first artificial colouring matter obtained from a coal-tar product was discovered and manufactured by William Henry Perkin under the trade name of "Mauve." The subsequent development of the coal-tar colour industry has been one continuous series of triumphs, and the colossal scale on which organic compounds of great complexity are now manufactured, often in a state approaching chemical purity, cannot but strike the future historian of scientific industry as one of the most marvellous achievements of applied organic chemistry of the present age. The marvel is enhanced when it is borne in mind that the whole of this industrial development, which has been made possible by the intervention of pure science at every stage, has taken place during the last half-century. The founder of the industry, Dr. Perkin, is happily still with us in full vigour, and a movement is now being organised to celebrate the jubilee of the discovery and to do honour to the discoverer. Preliminary meetings have been held under the auspices of the Chemical Society and a provisional committee formed, which committee has prepared a scheme for submission to a public meeting for adoption at the Mansion House on February 26 at 3 p.m., when the Lord Mayor has consented to take the chair. That the importance of the movement is being appreciated in this country is shown by the fact that, in addition to all the leading chemists and manufacturing chemists, the committee already comprises the names of Lords Halsbury, Rayleigh, Alverstone, and Avebury, the Right Hons. R. B. Haldane, A. J. Balfour, and Joseph Chamberlain, and representatives of the universities, Royal Society, the City companies, &c. The appreciation, moreover, is not limited to Perkin's own countrymen, and it is known that when the scheme has been formally adopted at the Mansion House meeting on February 26 other countries, and especially Germany, the present headquarters of the industry, will participate in the movement. Those who are interested in the scheme are invited to attend the meeting. The secretary to the committee is Prof. A. G. Green, of Leeds University, from whom particulars can be obtained.

A portrait of Dr. H. C. Sorby, F.R.S., subscribed for privately, and presented by the subscribers to the University of Sheffield, in commemoration of Dr. Sorby's scientific work and labours as one of the founders of the university, was unveiled on Monday, in the presence of a large assembly of leading citizens and other admirers of his devotion to scientific research and to the cause of higher education in Sheffield. Alderman Franklin, as president of the university council, opened the proceedings, and the portrait was unveiled by the Lady Mayoress. Mr. Simeon Snell and Prof. W. M. Hicks, F.R.S., who organised the movement for the presentation, in asking the University to accept the portrait, referred to Dr. Sorby's long association with Sheffield—he might, in fact, be regarded as the Dalton or the Priestley of Sheffield—and to his sixty years of active work for the advancement of science and the extension of natural knowledge. The state of Dr. Sorby's bodily health prevented him from being present at the ceremony, but he expressed his appreciation of the honour in a letter to Alderman Franklin. The portrait is a replica of one painted by Mrs. M. L. Waller, and now hanging in the rooms of the Sheffield Literary and Philosophical Society.

The gold medal of the Royal Astronomical Society has this year been awarded to Prof. W. W. Campbell, of the Lick Observatory, for his spectroscopic researches on the motions of stars in the line of sight. The medal was presented at the eighty-sixth anniversary meeting of the society on February 9, when the American Ambassador, Mr. Whitelaw Reid, received the medal on behalf of Prof. Campbell, who was unable to be present. Mr. Whitelaw Reid, in accepting the medal on Prof. Campbell's behalf, said he would certainly value the decoration as highly as a soldier or statesman would value one sent him by a Sovereign. The United States is proud of every advance in art or science made by her sons—prouder of these than of triumphs in trade or in war—and it will be gratified that this high recognition for service to one of the noblest of sciences came from a land to which they are so closely related.——It may be remarked that this is the third consecutive year that this medal has been awarded to an American astronomer. In fact, Mr. Choate, the late American Ambassador, in receiving the medal for Prof. Lewis Boss last year, remarked that it seemed quite one of the annual duties of the Ambassador to proceed to the rooms of the Royal Astronomical Society to receive the gold medal. Out of the list of the last thirteen medallists, no less than seven hail from the United States.

Active steps are being taken at York to ensure the success of the meeting of the British Association to be held there next August. Last Saturday, at a large and distinguished assembly, over which the Lord Mayor of York presided, the arrangements in connection with the forthcoming visit were advanced a further stage. A reception committee representative of the city and county was elected, and it was resolved to raise a fund of not less than 2500*l.* for the necessary expenses of the meeting. In an appropriate speech, the Lord Mayor moved "That this meeting agrees cordially to welcome the British Association to York this year from August 1–8, and in doing so attaches special interest to the fact that the Association began its existence in York seventy-five years ago." The Dean of York seconded this resolution (which was carried unanimously); and in supporting it Dr. Tempest Anderson referred to local connections with the association, the first officials of which included some of the leading members of the Yorkshire Philosophical Society. The local reception committee appointed on Saturday is an unusually strong one: the president is the Lord Archbishop of York; chairman, the Lord Mayor (Mr. R. H. V. Wragge); vice-chairman, Dr. Tempest Anderson; treasurer, Sir J. Sykes Rymer; and secretaries, Mr. R. Percy Dale and Mr. C. E. Elmhirst. Pro-Chancellor A. G. Lupton (University of Leeds) and Prof. W. M. Hicks (University of Sheffield) both spoke at the meeting, and expressed the desire of their universities to assist in making the forthcoming meeting of the association a success.

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